



# Redesigning FACTS I: It's the Customer, Stupid!

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Engineer  
Information Resources, FMS



# What is FACTS I?

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- Federal Agencies Centralized Trial-Balance System
- Supports preparation of the Financial Report of the U.S. Government
- Used by 200+ federal agency accountants to report data to Treasury:
  - Define the fund groups for reporting (Master Appropriation File, MAF)
  - Transmit USSGL adjusted trial balances (ATB)
  - Transmit NOTES financial and non-financial data



# FACTS I Project Context

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- Had to get off mainframe by Sept. '01
- Saw opportunity to improve system
- Had team of in-house developers with successful track record in redesigning mainframe systems to the Internet
- Had user centered design expert



# FACTS I Success Factors

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- Comprehensive, proactive planning
- Prioritized; made choices; deferred items
- Monitored timeline: best and worst cases
- Relatively small core team, empowered by management, made for easier decision-making without high-level micro-management
- FMS customer/sponsor key team member
- Frequent efficient project team meetings to facilitate communication and schedule progress



# More FACTS I Success Factors

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- Consistently involved key program and development team members
- Mutual respect and open-mindedness of team members
- Team dedication and lots of hard work
- Bulk ATB layout provided early to agencies
- Clear comprehensive user manuals; good MAF/ATB training
- Focused on user centered design



# History of User Centered Design (UCD)

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- WWII: Human Factors Engineering originated with pilots blowing themselves & planes up
- 1950-1970: Expanded to industrial design, transportation, consumer products
- 1985: PCs and computer industry
- 2002: Software mediates our experiences, shopping... traveling... accounting...



# Benefits of UCD

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- Facilitates teamwork
- Diminishes development “Black Box” effect
- Early customer involvement leads to effective implementations & ROI
- Produces satisfied customers
- Fosters customer-centric organization



# Five Major Steps in UCD

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1. Gather Data on Customers and Tasks
2. Establish Usability Goals for Major Tasks (Performance Metrics)
3. Design Low-Fidelity Prototypes
4. Iterate with Usability Tests for “Correct Fit”
5. Manage Every Aspect of the Customer Experience





# 1. Gather Data on Customers and Tasks

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- Interviewed internal FMS customers to understand FACTS I process
- Interviewed 8 agency accountants from 4 representative agencies to understand how work was actually done; developed **FACTS I Customer Profile**



# FACTS I Customer Profile

**Total FACTS I Customers: 500**

<b>Customer Type</b>	<b>#</b>	<b>Tasks &amp; Characteristics</b>
Federal Program Agency (FPA) System Accountants	200	<p><b>Staffing:</b> MAF, ATB, &amp; Notes (85%); Notes only (15%) Represents 40 dept., agencies, and federal entities <b>Annual turnover:</b> Less than 5% (2001: 30%) Average time in job: 8 years <b>Frequency of use: Once a year</b> <b>Internet comfort:</b> Intermediate; has at home; approx. 50% use credit cards over Internet for purchases <b>Bulk Users:</b> 20% of preparers (30) using Bulk transmission account for 51% of ATBs submitted</p>



# 1. Gather Data on Customers and Tasks

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- Developed a wall of **task flow diagrams** using 3x5 cards, Post-Its, and flipcharts



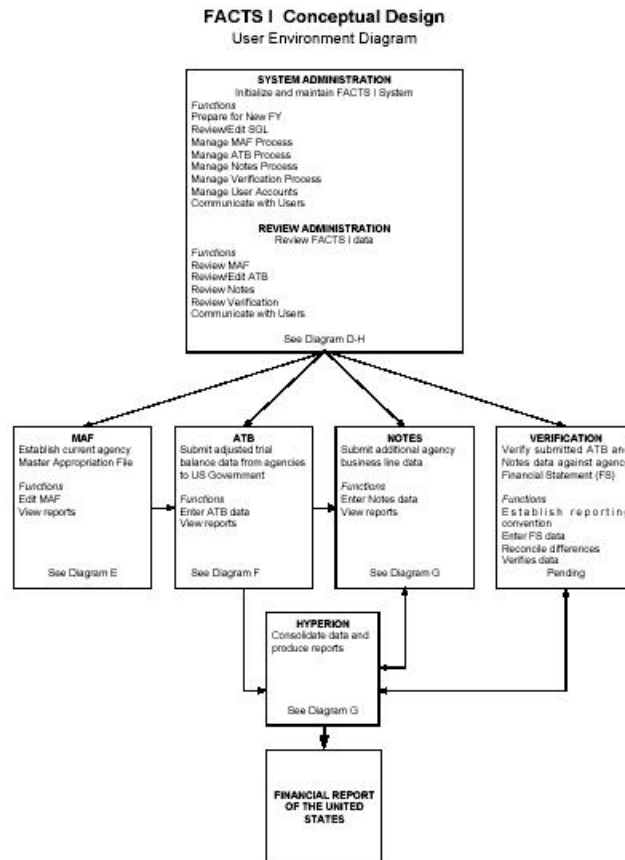


# 1. Gather Data on Customers and Tasks

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- Interviewed internal FMS customers to understand FACTS I process
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- Developed a wall of task flow diagrams using 3x5 cards, Post-Its, and flipcharts
- “Walked the wall” with developers & customers; clarified need to design system around roles and tasks within roles
- Developed **conceptual design document**; walked through with customers; clarified the design

# Conceptual Design Document





# UCD is Customer Involvement

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- Visited agencies & interviewed customers in context of their work
- Created & validated customer profiles & task data
- Conducted tests of low-fidelity prototypes & early software versions with customers
- E-mailed customers for answers to questions
- Surveyed customers at training sessions and after implementation



# Choosing Representative Customers

Agency	Factors (Size; organization; work arrangement; Internet comfort level; means of ATB transmission)
Energy	Large; centralized; ATB & Notes combined; medium comfort with Internet; bulk file ATB transmission
NASA	Small; centralized; ATB & Notes combined; high comfort with Internet; online transmission
HHS	Large; decentralized; ATB & Notes separated; medium comfort with Internet; online transmission
OPM	Large; centralized; ATB & Notes separated; low-medium comfort with Internet; online transmission





## Additional Uses for Customer/Task Data

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- Agree on “#1 Customers”
- Align system design to customer tasks and attributes
- Prioritize requirements by role/tasks
- Encourage early implementation planning
- Justify project budget/schedule/scope
- Document actual number of customers, roles, & personnel affected



## 2. Usability Goals (Metrics)

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- Acceptable timeframes for core customer tasks
- Usefulness; Ease of Use; Ease of Learning; Attitude
- Interviewed operations mgrs and customers
- Timed tasks to gauge development success



## 2. Usability Goals (excerpt)

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### **Preparer Ease Of Use: 75%**

- Edit MAF, enter ATB data, review/print reports, and transmit reports in **two attempts**.
- Edit MAF/Enter ATB data: no more than **1 minute per MAF or ATB** record.
- Submit initial ATB bulk file: no more than **10 minutes** and **2 attempts**.



## 2. Usability Goals

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### **Post-Implementation Poll (5% Sample)**

**Goal: Preparer Attitude, 75% Good/Excellent**

- Login, Home Page, MAF, Notes: **90%**
- ATB: **77%**
- Reference Tables & Downloads: **83%**



### 3. Design Low-Fidelity Prototypes

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- Non-functional mock-ups made of paper, Post-its, Word or Visio screens
- Tested low-fi with FMS admin customers;
- “Tension with Technologists”: Combination of Word docs & HTML screens; HTML was re-used
- Time constraints prevented us from testing additional low-fi prototypes with agency customers



## 4. Iterate with Usability Tests for “Correct Fit”

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- Tested early versions with accountants from four agencies
- Focused on main tasks in area being tested
- Developed **test script** and **task scenarios**



# Test Script (excerpt)

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- Thank you so much for coming. Before I say anymore I want to make it clear that it's the system that's being tested, not you! Please don't be apprehensive. What we learn from observing you trying to use the system will help us make it even easier to use when we implement it...



# Task Scenario (excerpt)

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## **Edit MAF Tasks**

1. Access MAF
2. Edit 95081900: Change BSF code to 506
3. Delete 95090650. Comment: Record no longer active
4. Add new BL: BL02 Ancillary Activities



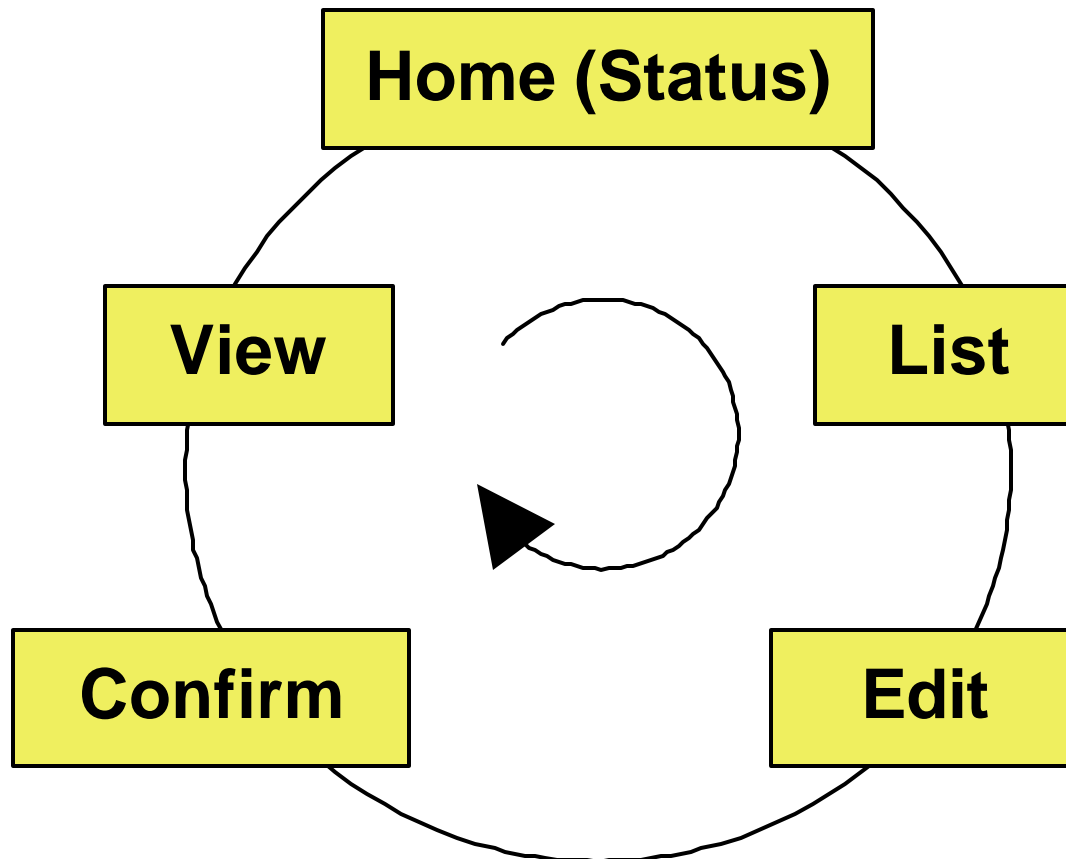


## 4. Iterate with Usability Tests for “Correct Fit”

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- Tested early versions with accountants from four agencies
- Focused on main tasks in area being tested
- Developed test script and task scenarios
- Followed test protocol:
  - No coaching of test participants
  - Observers took notes; no talking
  - Participants “talked aloud” while working
- Debriefed at end with refreshments

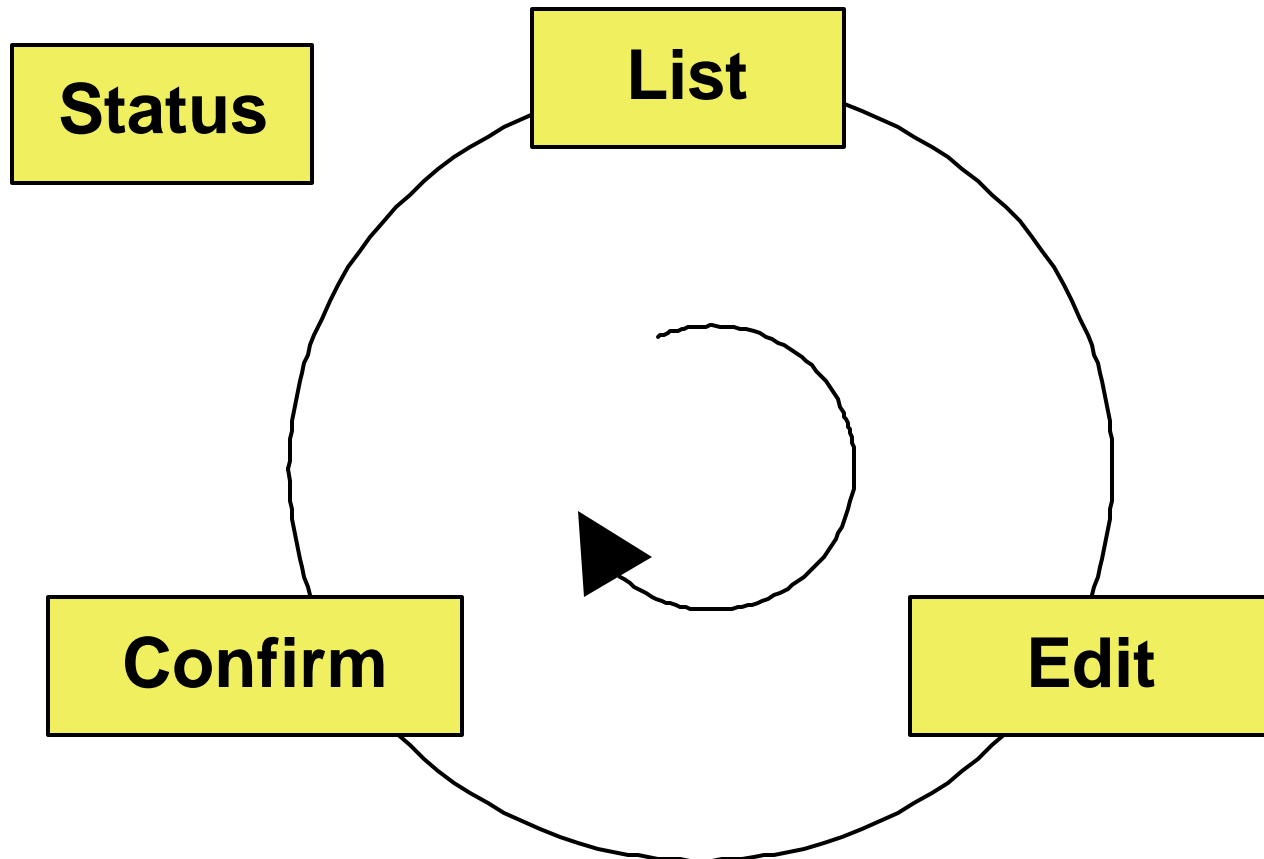
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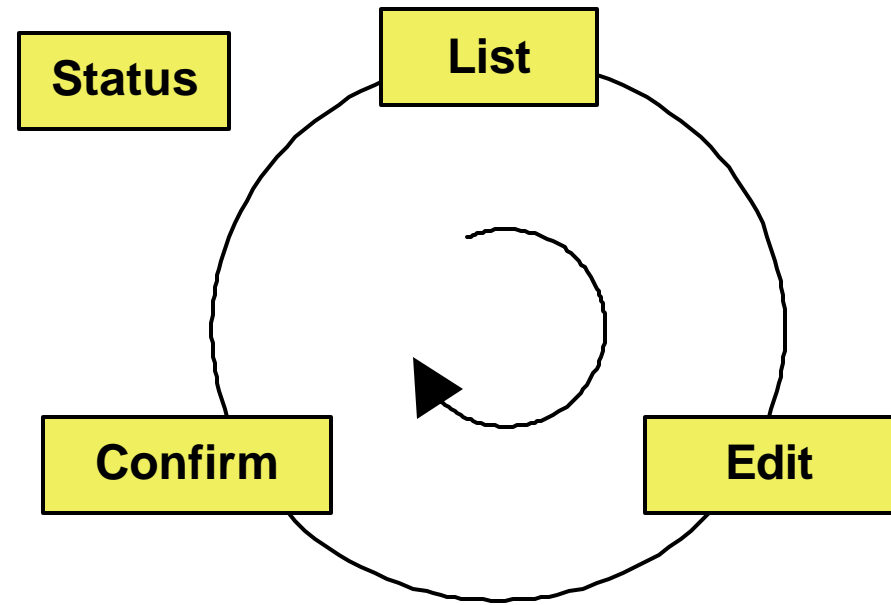
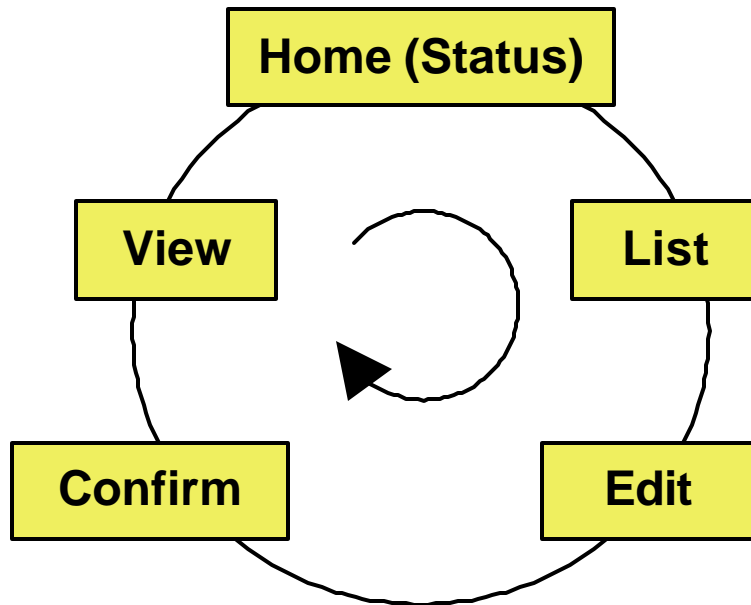


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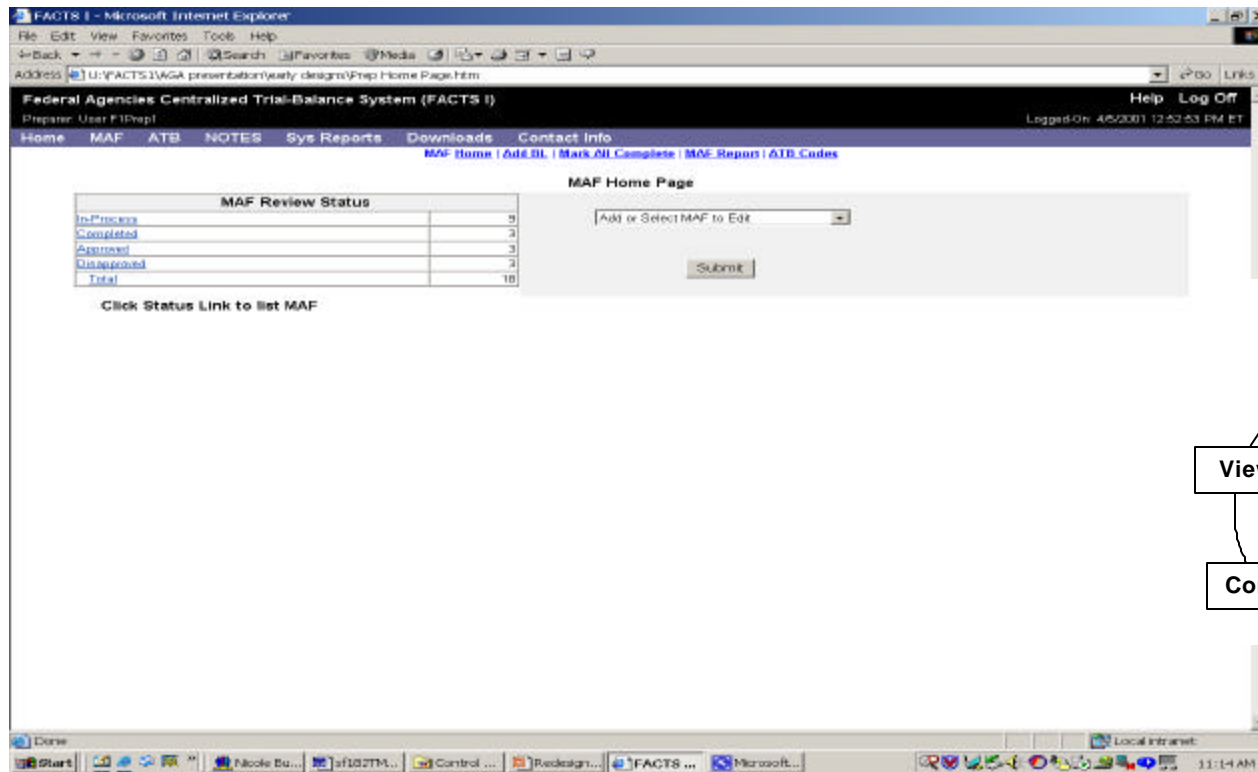
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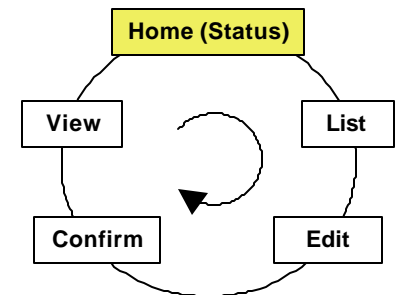
# MAF Process: Before & After



# MAF Home (Status) Page



MAF Process Before



# List MAF

FACTS I - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address [U:\FACTS\VAQA presentation\early designs\Preparers MAF Edit - Completed.htm](#)

**Federal Agencies Centralized Trial-Balance System (FACTS I)**

Preparer: User FTHep1 Help Log Off

Home MAF ATB NOTES Sys Reports Downloads Contact Info

MAF Home | Add BL | Mark All Complete | MAF Report | ATB Codes

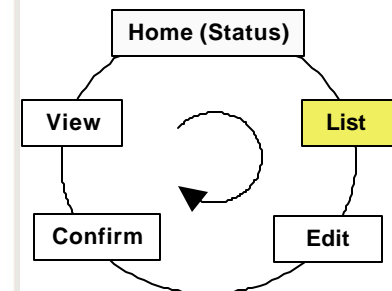
**In-Process MAF**

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75 07 0128	Office of Inspector General	551	1	06	C	C	<a href="#">Edit</a>   <a href="#">View</a>
75 07 0135	Office of Consumer Affairs	551	1	06	A	A	<a href="#">Edit</a>   <a href="#">View</a>
75 07 0137	Office of Civil Rights	551	1	06		D	<a href="#">Edit</a>   <a href="#">View</a>
75 07 0200	Appalachian Regional Commission	551	1	06	D	A	<a href="#">Edit</a>   <a href="#">View</a>
75 07 1101	Public Health Service Mgmt	551	1	06	A	A	<a href="#">Edit</a>   <a href="#">View</a>
75 07 1102	Foreign Curr Prog - Solon - Act Ove	551	1	06		I	<a href="#">Edit</a>   <a href="#">View</a>
75 07 0140	Public Health & Social Serv EMG	551	1	06		I	<a href="#">Edit</a>   <a href="#">View</a>
75 07 0141	Public Health Overseas	551	1	06	C	D	<a href="#">Edit</a>   <a href="#">View</a>
75 07 0143	Public Health & Env Sys	551	1	06		I	<a href="#">Edit</a>   <a href="#">View</a>
75 07 0151	Hospital Services	551	1	06		I	<a href="#">Edit</a>   <a href="#">View</a>
75 07 0152	Medical Regional Ops - Svs	551	1	06		I	<a href="#">Edit</a>   <a href="#">View</a>
75 07 0154	Public Health Educational Fund	551	1	06	C	C	<a href="#">Edit</a>   <a href="#">View</a>
75 07 0155	Hospital Mgt Grant Svs	551	1	06	A	C	<a href="#">Edit</a>   <a href="#">View</a>
75 07 0162	Medical Emer Trng Programs	551	1	06		I	<a href="#">Edit</a>   <a href="#">View</a>
75 07 0163	Research Med Trng	551	1	06	C	D	<a href="#">Edit</a>   <a href="#">View</a>
75 07 0170	Public Health Diversity Svcs	551	1	06		I	<a href="#">Edit</a>   <a href="#">View</a>
75 07 0140	Public Health & Social Serv EMG	551	1	06		I	<a href="#">Edit</a>   <a href="#">View</a>

Rev Status: E=In-process, C=Completed, A=Approved, D=Disapproved

[Add MAF](#)

MAF Process Before



# Edit MAF

FACTS I - Microsoft Internet Explorer

File Edit View Favorites Tools Help

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Help Log Off

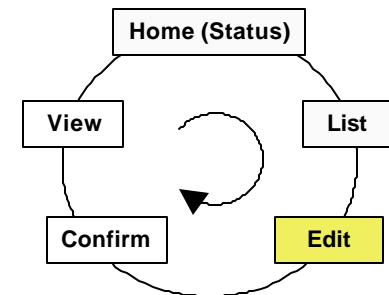
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Home MAF ATB NOTES Sys Reports Downloads Contact Info

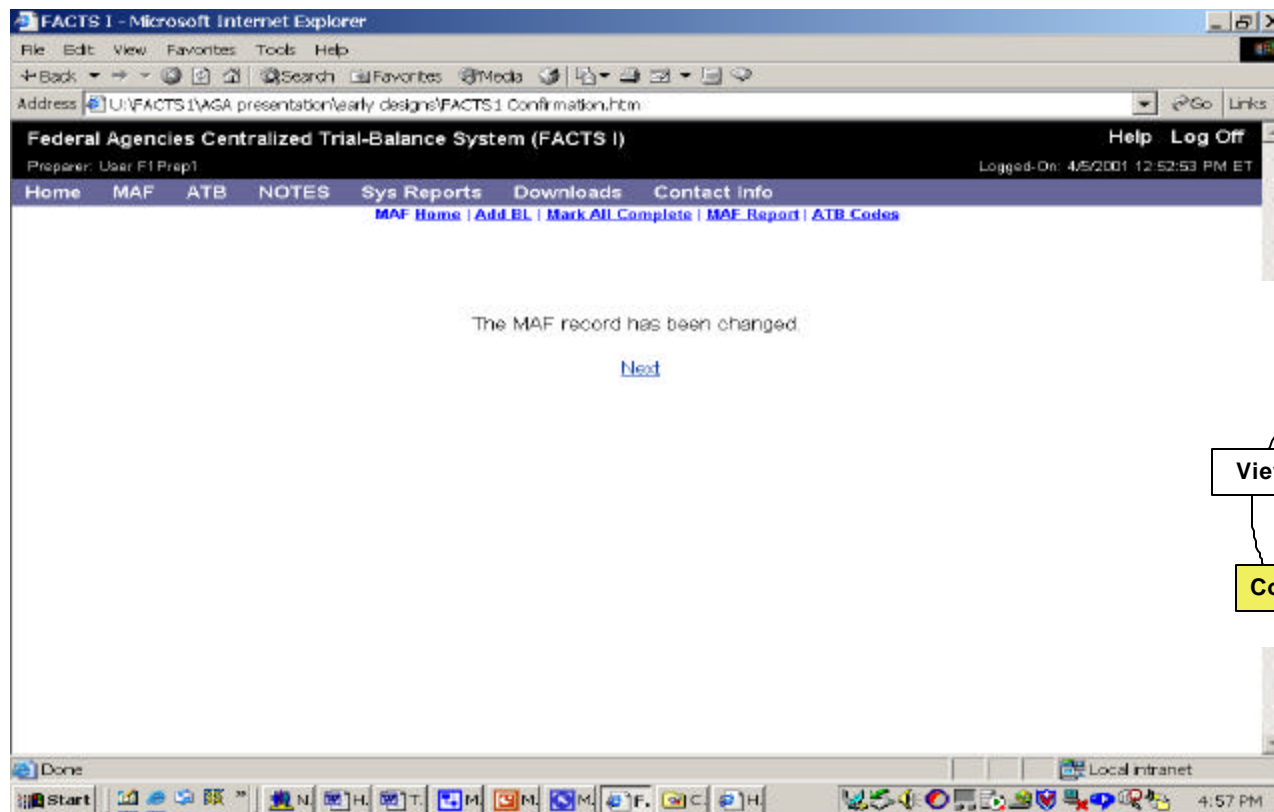
MAF Home | Add BL | Mark All Complete | MAF Report | ATB Codes

<b>Status: In-process</b>	
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Bureau:	07 XYZ Bureau
* Fund Grp Title:	0120 General Departmental (General Department Mgmt)
* BSF:	506 Social services (506 Other Labor Services)
* Fund Type:	6 Deposit Funds (6 Trust (nonworking) Fund)
Business Line:	06 Business line 06 (Select Business Line)
FPA Comments:	09/12/2000 15:13 (preparer_id) FPA comments go here
FMS Comments:	09/11/2000 15:13 (reviewer_id)
Approved Changes:	09/11/2000 11:32 (cjohnson) BSF 551 > 552 09/11/2000 11:32 (cjohnson) BL 05 > 06 09/11/2000 11:32 (cjohnson) FT 6 > 5
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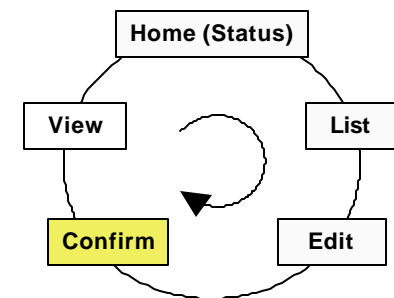
MAF Process Before



# Confirm MAF



MAF Process Before





# View MAF

FACTS I - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Search Favorites Media

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Go Links

**Federal Agencies Centralized Trial-Balance System (FACTS I)**

Preparer: User F1Prep1

Help Log Off

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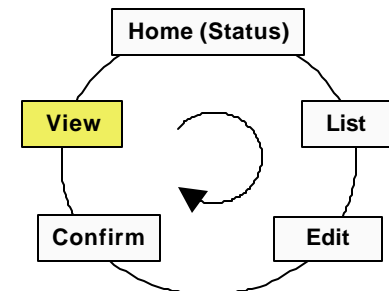
Home MAF ATB NOTES Sys Reports Downloads Contact info

MAF Home | Add BL | Mark All Complete | MAF Report | ATB Codes

View MAF	
Dept:	76 Department of Health and Human Services
Bureau:	07 XYZ Bureau
* Fund Grp Title:	0120 General Departmental General Department Mgmt
* BSF:	506 Social Services 505 Other Labor Services
* Fund Type:	6 Deposit Funds 7 Trust (Nonrevolving) Fund
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FMS Comments:	09/11/2000 15:13 (reviewer_id)
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Edit Return

MAF Process Before



# List MAF

FACTS I - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address: U:\FACTS\MAF presentation\early design\Prepares MAF Edit - Revised.htm

Federal Agencies Centralized Trial-Balance System (FACTS I)

Preparer: User FIPrep1

Help Log Off

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MAF Home | Add BL | Mark All Complete | MAF Report | ATB Codes

In-Process MAF

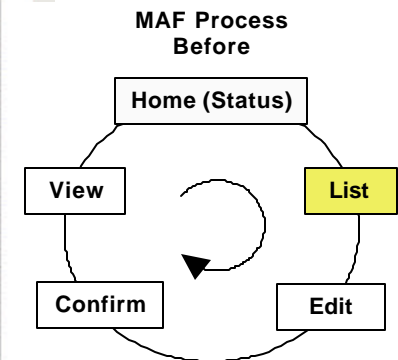
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75 07 0128	Office of Inspector General	551	1	06	C	C	<a href="#">Edit</a>   <a href="#">View</a>
75 07 0135	Office of Consumer Affairs	551	1	06	A	A	<a href="#">Edit</a>   <a href="#">View</a>
75 07 0137	Office of Civil Rights	551	1	06		D	<a href="#">Edit</a>   <a href="#">View</a>
75 07 0200	Appalachian Regional Commission	551	1	06	D	A	<a href="#">Edit</a>   <a href="#">View</a>
75 07 1101	Public Health Service Mgmt	551	1	06	A	A	<a href="#">Edit</a>   <a href="#">View</a>
75 07 1102	Foreig Curr Prog. Scien. Act Ove	551	1	06		I	<a href="#">Edit</a>   <a href="#">View</a>
75 07 0140	Public Health & Social Serv EMS	551	1	06		I	<a href="#">Edit</a>   <a href="#">View</a>
75 07 0141	Public Health Overseas	551	1	06	C	D	<a href="#">Edit</a>   <a href="#">View</a>
75 07 0143	Public Health & Env Svs	551	1	06		I	<a href="#">Edit</a>   <a href="#">View</a>
75 07 0151	Hospital Services	551	1	06		I	<a href="#">Edit</a>   <a href="#">View</a>
75 07 0152	Medical Regional Ops. Svs	551	1	06		I	<a href="#">Edit</a>   <a href="#">View</a>
75 07 0154	Public Health Educational Fund	551	1	06	C	C	<a href="#">Edit</a>   <a href="#">View</a>
75 07 0155	Hospital Mgt Grant Svs	551	1	06	A	C	<a href="#">Edit</a>   <a href="#">View</a>
75 07 0162	Medical Emer Trng Programs	551	1	06		I	<a href="#">Edit</a>   <a href="#">View</a>
75 07 0163	Research Med Trng	551	1	06	C	D	<a href="#">Edit</a>   <a href="#">View</a>
75 07 0170	Public Health Diversity Svcs	551	1	06		I	<a href="#">Edit</a>   <a href="#">View</a>
75 07 0140	Public Health & Social Serv EMS	551	1	06		I	<a href="#">Edit</a>   <a href="#">View</a>

Rev Status: P=In-process, C=Completed, A=Approved, D=Disapproved

Done

Start | Nicole ... | THRD C... | TROR... | Micro... | Micro... | Micro... | Micro... | FACT... | Control... | Local intranet

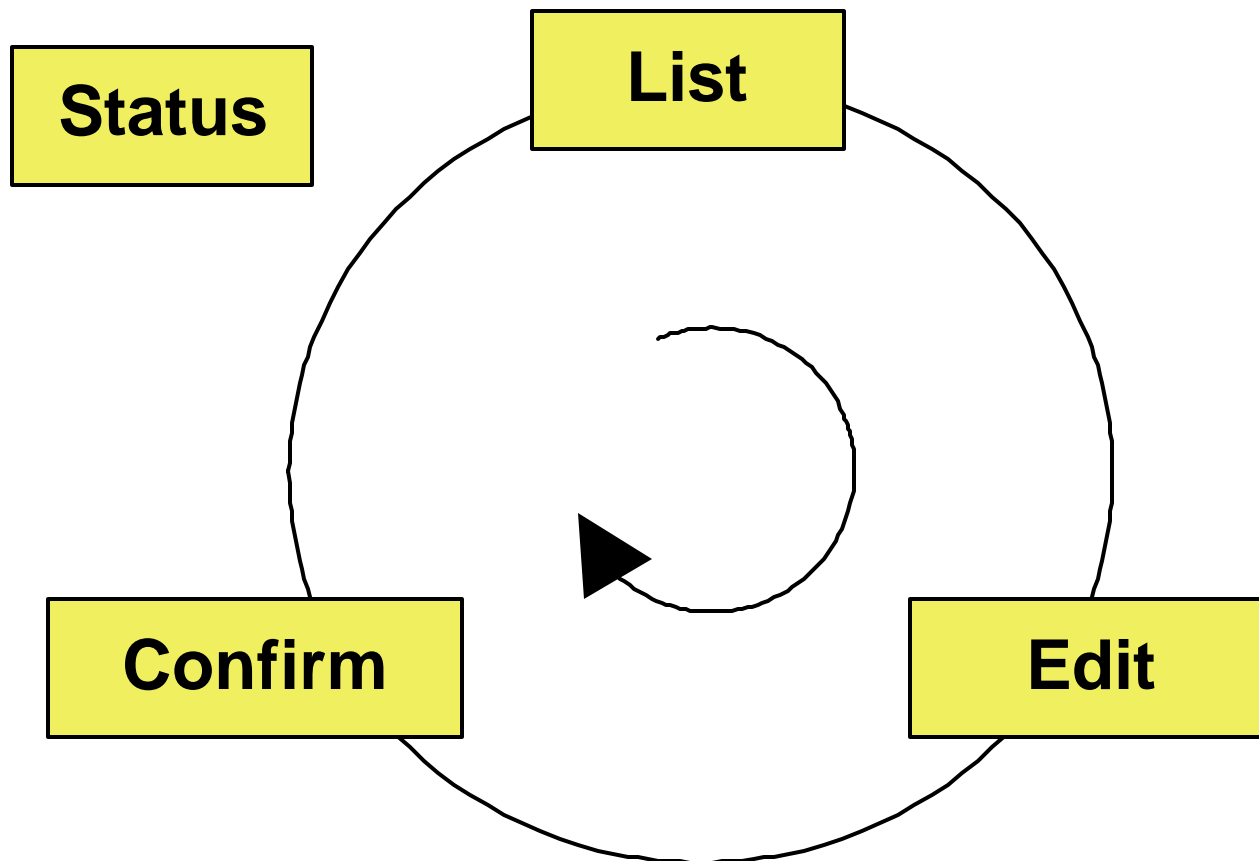
11:16 AM





# MAF Preparer Process (After)

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# List MAF

Federal Agencies Centralized Trial-Balance System (FACTS I) - Microsoft Internet Explorer

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Preparer: NICOLE BURTON Help LOG OFF

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### Edit MAF List

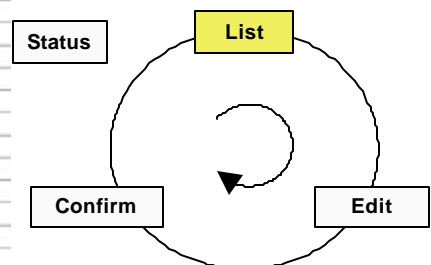
Total MAF

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Status: I=In-process, S=Submitted, A=Approved, D=Disapproved						
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00 01 0995	Training Salaries & Expenses	151	7	10	Chg I	<a href="#">Edit</a>   <a href="#">Submit</a>
00 01 0996	Change Training Two	351	1	01	Chg D	<a href="#">Edit</a>   <a href="#">Submit</a>
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00 02 0998	FACTS I Training ATB Code	451	2	01	Add A	<a href="#">Edit</a>   <a href="#">Submit</a>
00 03 0995	Training Salaries & Expenses	151	13	01	Chg A	<a href="#">Edit</a>   <a href="#">Submit</a>
00 03 0996	Change Training Two	351	1	01	Chg A	<a href="#">Edit</a>   <a href="#">Submit</a>
00 03 0997	Change Training Three	351	3	03	Chg A	<a href="#">Edit</a>   <a href="#">Submit</a>
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00 04 0998	facts i training salary	451	2	01	Add A	<a href="#">Edit</a>   <a href="#">Submit</a>
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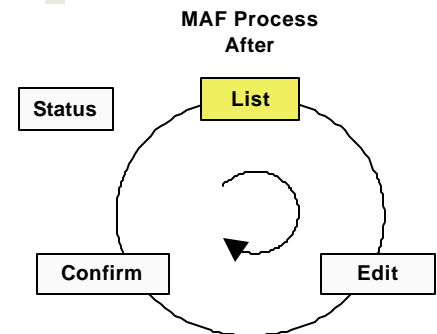
Done Internet

Start Nicole Burton - Inb... Hotmail Inbox - M... Federal Agencies... Control Panel 10:35 AM

MAF Process After



# Getting Started/Screen Tips



# Edit MAF

Federal Agencies Centralized Trial-Balance System (FACTS I) - Microsoft Internet Explorer

File Edit View Favorites Tools Help

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Federal Agencies Centralized Trial-Balance System (FACTS I)

Prepared: NICOLE BURTON

Help Log On 6/3/2002 10:30:21 AM CT

Home MAF AFB NOTES Ref Tables Downloads Contact Info

Edit MAF List MAF Requests Submit All to FMS Check MAF Status Add Bus Line

Screen Tip

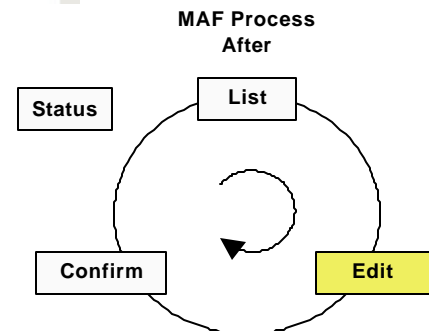
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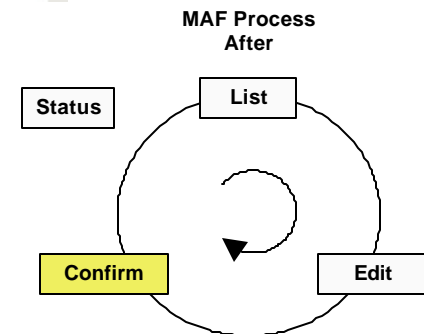
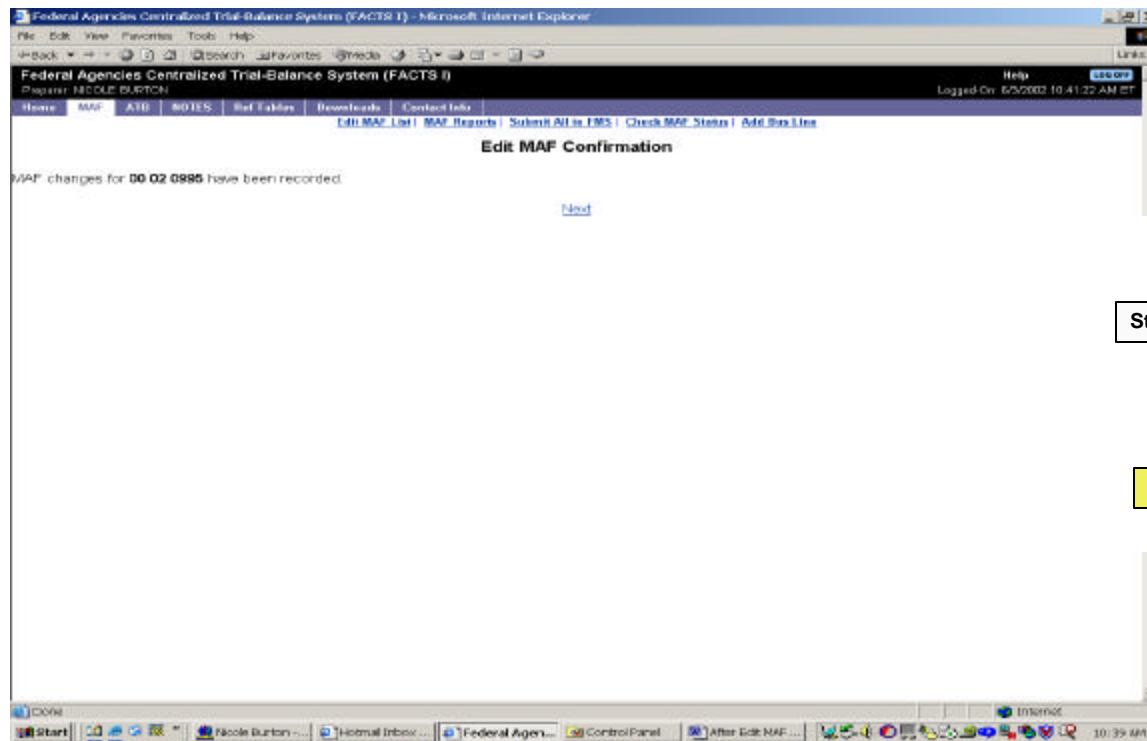
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Bureau:	02 TEST BUREAU 02
Fund Grp Title:	0996 Change Training One <small>Enter new Fund Grp Title</small>
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Fund Type:	12 Credit Reform - Financing Account <small>Select Fund Type</small> <small>Select new Fund Type</small>
Business Line:	02 Test BL - 0002 <small>Select Bus Line</small> <small>Select new Bus Line</small>
Explanation:	07/24/2001 13:33 (keemith) Change the fund type per FMS request <div style="border: 1px solid black; height: 40px; width: 100%;"></div>
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Change Delete Cancel

Start Nicole Burton Hotmail Inbox Federal Agen Control Panel After Edit MAF Internet 10:39 AM



# Confirm MAF





# List MAF

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Federal Agencies Centralized Trial-Balance System (FACTS I) Help **Logout**

Preparer: NICOLE BURTON Logged On: 6/3/2002 10:41:45 AM ET

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[Getting Started](#)  
[Screen Tip](#)

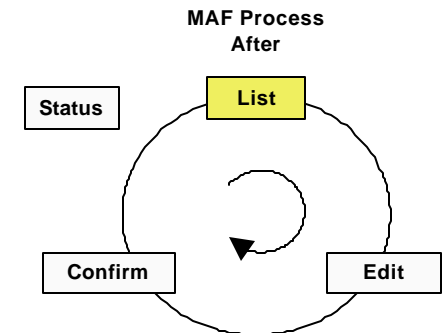
### Edit MAF List

Total MAF

ATB Code	Fund Group Title	BSF	Fund Type	Bus Line	Status	Action
Status: I=In-process, S=Submitted, A=Approved, D=Disapproved						
<a href="#">Add MAF</a>						
00 01 0100	test1	015	1	11	Chg A	<a href="#">Edit</a>   <a href="#">Submit</a>
00 01 0995	Training Salaries & Expenses	151	7	10	Chg I	<a href="#">Edit</a>   <a href="#">Submit</a>
00 01 0996	Change Training Two	351	1	01	Chg D	<a href="#">Edit</a>   <a href="#">Submit</a>
00 01 0997	Change Training Three	351	3	02	Chg A	<a href="#">Edit</a>   <a href="#">Submit</a>
00 01 0998	FACTS1 Training ATB Code	451	2	01	Add A	<a href="#">Edit</a>   <a href="#">Submit</a>
00 02 0995	Change Training One	151	10	02	Chg I	<a href="#">Edit</a>   <a href="#">Submit</a>
00 02 0996	Change Training Two	351	1	03	Chg A	<a href="#">Edit</a>   <a href="#">Submit</a>
00 02 0997	Change Training Three	351	3	01	D	<a href="#">Edit</a>   <a href="#">Submit</a>
00 02 0998	FACTS I Training ATB Code	451	2	01	Add A	<a href="#">Edit</a>   <a href="#">Submit</a>
00 03 0995	Training Salaries & Expenses	151	13	01	Chg A	<a href="#">Edit</a>   <a href="#">Submit</a>
00 03 0996	Change Training Two	351	1	01	Chg A	<a href="#">Edit</a>   <a href="#">Submit</a>
00 03 0997	Change Training Three	351	3	03	Chg A	<a href="#">Edit</a>   <a href="#">Submit</a>
00 03 5998	FACTS1 Training Salaries	451	2	01	Add A	<a href="#">Edit</a>   <a href="#">Submit</a>
00 04 0995	training salaries and expenses	151	6	01	Chg I	<a href="#">Edit</a>   <a href="#">Submit</a>
00 04 0996	Change Training Two	351	1	01	Chg A	<a href="#">Edit</a>   <a href="#">Submit</a>
00 04 0997	Change Training Three	351	3	02	Chg A	<a href="#">Edit</a>   <a href="#">Submit</a>
00 04 5998	facts i training salary	451	2	01	Add A	<a href="#">Edit</a>   <a href="#">Submit</a>
00 05 0994	Presidential Incentive	920	2	05	Add A	<a href="#">Edit</a>   <a href="#">Submit</a>
00 05 0995	Changing Fund Group	151	11	01	Chg A	<a href="#">Edit</a>   <a href="#">Submit</a>
00 05 0996	Change Training Two	351	1	01	Chg A	<a href="#">Edit</a>   <a href="#">Submit</a>
00 05 0997	Change Training Three	351	3	04	Chg A	<a href="#">Edit</a>   <a href="#">Submit</a>
00 05 0998	FACTS 1 Training Salaries	451	2	01	Add A	<a href="#">Edit</a>   <a href="#">Submit</a>
00 06 0994	presidential incentive	920	2	01	Add A	<a href="#">Edit</a>   <a href="#">Submit</a>
00 06 0995	changing fund group	151	11	01	Chg A	<a href="#">Edit</a>   <a href="#">Submit</a>
00 06 0996	Change Training Two	351	2	01	Chg I	<a href="#">Edit</a>   <a href="#">Submit</a>

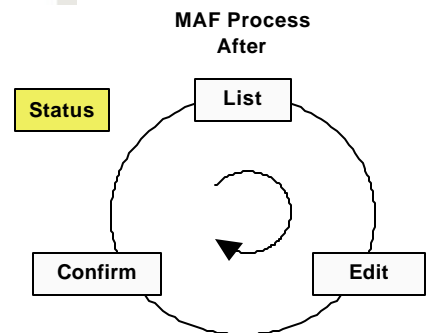
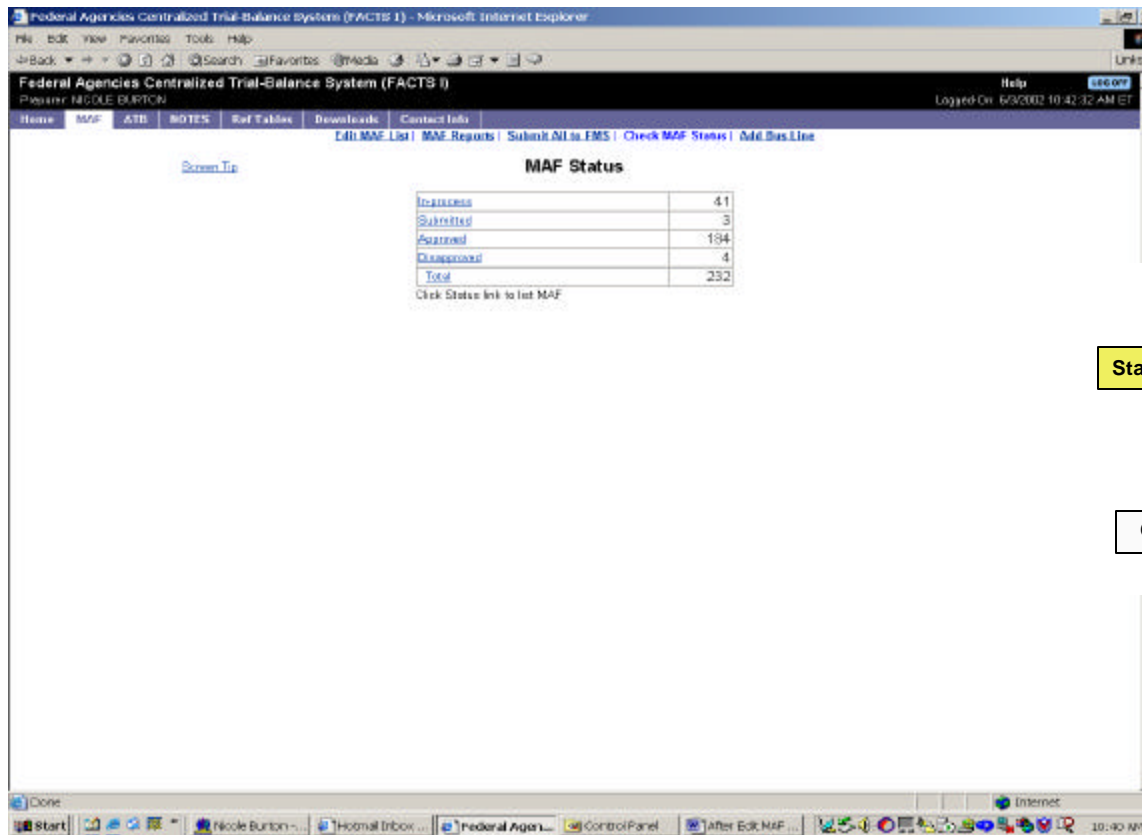
Done Internet

Start Nicole Burton... Federal Agen... Control Panel After Edit MAF... 10:39 AM





# Status





# 5. Manage the Customer Experience

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Additional customer touch-points:

- Log-on and user access process (no Secure ID)
- Error messages
- Screen tips and user manual
- Beta test site
- Bulk layout & user manuals on FMS Website
- Help desk and customer support staff
- Training, external and internal customers
- Surveys with customers
- Announcement letters to agencies



# UCD Lessons Learned

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- Earlier low-fidelity prototyping activities
- Enhanced personas
- More contextual interviews
- Dedicated design room and project space
- Usability test lab with videotaping
- Planned archiving of early design versions
- More UCD resources



# UCD Resources

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- Contracting vs. in-house expertise
- Recommended resources:
  - Usability Professionals Association, [www.upassoc.org](http://www.upassoc.org)
  - Association for Computing Machinery, Sig-CHI, [www.acm.org/sigchi](http://www.acm.org/sigchi)
  - National Cancer Institute, [www.usability.gov](http://www.usability.gov)
  - "A Usability Analysis of Selected Federal Government Web Sites," [www.govexec.com/dailyfed/0302/030802j1.htm](http://www.govexec.com/dailyfed/0302/030802j1.htm)



# Questions?

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